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PRELIMINARY ANALYSIS
OF AN
INTEGRATED LOGISTICS SYSTEM **N88-19480**
FOR
OSSA PAYLOADS

Volume III
OSSA Integrated Logistics Support
Planning Document

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1.0 INTRODUCTION

1.1 PURPOSE

This document provides guidance for use in preparing and updating an Integrated Logistics Support Plan (ILSP). It provides clear, concise, and detailed instructions on the preparation and content of an ILSP to ensure a quality document that reflects total ILS program requirements.

1.2 SCOPE

The provisions of this document apply to the Office of Space Science and Applications, all payload programs under their auspices, and contractors having management and/or technical responsibility for OSSA programs.

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2.0 ILS OVERVIEW

2.1 DEFINITION

An ILS program improves operational availability and logistic support management while minimizing operations and support costs. The ILS process has two main goals: insuring that logistics considerations are integrated into the design effort, and insuring the design, development, test and acquisition of the support that will ensure availability and affordability of the developed system.

ILS is a disciplined, unified, and iterative approach to the management and technical activities necessary to:

- a. Integrate support considerations into system and equipment design.
- b. Develop the support requirements.
- c. Acquire the required support.
- d. Provide the required support during the operational phase at minimum cost.

2.2 ILS POLICY

- a. Acquisition programs will include an ILS program that begins at payload program initiation and continues for the life of the system.
- b. Supportability is a principal design and program requirement as important as cost, schedule, and performance. It will be an equally weighted consideration in developing the acquisition strategy. Supportability will be considered in all program and budget decisions, trade-off analyses, test and evaluation, and other program events in the acquisition process.

c. All elements of the support system must be planned, acquired, tested, and deployed in phase with the payload. A support system must consist of those tangible logistics support resources required to sustain an operational payload. The support system is developed and tested with the payload and is ultimately merged with the ongoing logistics system upon production and deployment. The ILS elements are:

1. Maintenance Planning
2. Manpower and Personnel
3. Supply Support
4. Support Equipment
5. Technical Data
6. Training and Training Support
7. Computer Resources Support
8. Facilities
9. Packaging, Handling, Storage, and Transportation
10. Design Interface

All elements of ILS must be developed in coordination with each other. Trade-offs may be required between elements in order to acquire a system that is within cost constraints.

2.3 ILS OBJECTIVES

The objectives of ILS are to:

- a. Influence system requirements and design to achieve and sustain established operational requirements while minimizing operations and support costs.
- b. Ensure that all ILS elements are planned, developed, tested, evaluated, acquired, and deployed prior to or concurrently with the system.
- c. Improve logistics commonality within OSSA, NASA, and other agencies.
- d. Optimize system support throughout the life of the system.

3.0 ILSP PROCEDURES

3.1 DEVELOPMENT

The payload program manager will draft an ILSP during Phase B and keep it current throughout acquisition. The ILSP will integrate the logistics elements of the program.

3.2 IMPLEMENTATION

The approved ILSP becomes the ILS program implementation plan for all participating activities. It is included as part of the program management documentation. The latest approved ILSP will be used as a working document by all ILS program participants.

3.3 DESCRIPTION

The ILSP is the principal logistics document for an acquisition program and serves as a source document for summary and consolidated information required in other program management documents. The ILSP describes the overall ILS program including requirements, tasks, and milestones for the immediate acquisition phase and plans for succeeding phases. The plan is tailored to the specific needs of each program and will address the total system including the payload, training devices, and support equipment. The ILSP provides:

- a. A complete plan for support of the operational payload.
- b. Details of the ILS program and its relationship with overall program management.
- c. Information to decision making bodies on ILS aspects necessary for sound decisions on further development of the system.
- d. Information necessary for the preparation of the ILS sections of procurement documents.

3.4 TIME PHASING

The ILSP is a dynamic document. The initial ILSP is prepared prior to the first key decision in the system acquisition cycle. The ILSP is updated:

- a. When new program direction is received.
- b. When there are changes that involve personnel, training, facilities, or other ILS planning elements.
- c. Before key decisions in the system acquisition cycle.
- d. When there are major system configuration changes.
- e. Prior to development of solicitation documents.

4.0 ILSP CONTENT

4.1 ORGANIZATION

The ILSP contains the three sections listed below and any necessary annexes.

4.1.1 Section I, General

1. Introduction
2. System Description
3. Program Management
4. Applicable Documents

4.1.2 Section II, Plans, Goals, and Strategy

1. Mission Need Statement
2. Acquisition Strategy
3. Logistics Support Analysis (LSA) Strategy
4. Supportability Test and Evaluation
5. ILS Element Plans
 - a. Maintenance Plan
 - b. Logistics Support Personnel and Training Plan

- c. Supply Support Plan
- d. Support Equipment Plan
- e. Technical Data and Documentation Plan Plan
- f. Logistics Facilities Plan
- g. Logistics Information System Plan
- h. Packaging, Handling, Storage, and Transportation Plan

4.1.3 Section III, ILS Milestone Schedule

4.1.4 Annexes (as applicable)

4.2 CONTENT OF SECTION I - GENERAL

4.2.1 Introduction - Provide general background information about the system being acquired, if available. The following areas will be addressed:

- a. Purpose - Provide a brief statement on the uses that will be made of the ILSP.
- b. Background - Summarize past actions and events. Identify major decision points and any significant program changes that have taken place.
- c. Application - State what the ILSP covers and what life cycle phase(s) it applies to.
- d. Iteration - Identify the latest ILSP iteration by number and date. Summarize the latest changes made, and state when the next review is planned. A separate change page showing updates and date of approval will provide an historical record to identify changes.
- e. Abbreviations - List the abbreviations and acronyms used in the ILSP.

4.2.2 System Description

- a. Describe the overall system. Include a description of all components/subsystems.
- b. Describe the system software that will be used.

- c. Describe the training devices that will train maintenance and operator personnel.

4.2.3 Program Management

Identify the ILS manager. Identify all participating organizations, including other agencies and countries. Specify the ILS management team (ILSMT).

4.2.4 Applicable Documents

Identify documents providing guidance, parameters, performance characteristics, and other criteria for functions and requirements described in the ILSP.

4.3 CONTENT OF SECTION II - PLANS, GOALS, AND STRATEGY

- 4.3.1 Mission Need Statement - Describe the Mission Need Statement in terms of the mission to be accomplished. Identify agency components to be involved in the mission and their roles and responsibilities.
- 4.3.2 Acquisition Strategy - Describe the anticipated acquisition approach. Define contractual approaches and incentives for the areas below.
 - a. Life Cycle Cost (LCC) - Identify actions to reduce acquisition and/or operations and support (O&S) costs.
 - b. Support Risks - Identify risks associated with system support alternatives. As a minimum, the following areas will be addressed:
 - (1) What are the effects of changing the level of maintenance/repair capability?
 - (2) Are there items or subsystems in the inventory that can be used to reduce development risk/requirements?
 - (3) How will the proposed system be integrated into the NASA integrated logistics support system?
 - c. Sustaining Engineering - Describe actions to reduce requirements for a high level of sustaining engineering to operate and maintain the system.
 - d. Source Selection - Describe how ILS and supportability will be addressed in the source selection process. Include any plans to consider estimated cost of operations and support, in addition to anticipated acquisition cost, when making the source selection evaluation.

- e. Reliability, Availability, and Maintainability (RAM) - Identify actions to provide incentive to reduce potential LCC, increase system reliability, and reduce maintenance requirements.
- f. Transportability - Describe what efforts have been made to assure that the system is engineered to be transportable by a standard transportation mode.
- g. Other Data - Include any other acquisition strategy data as it relates to the ILS program.

4.3.3 LSA Strategy

Describe the LSA strategy to be used in the acquisition effort. The LSA effort will be tailored to the unique characteristics of each payload. Tailoring is accomplished by selecting applicable LSA tasks and subtasks. Table 4-1 lists the LSA tasks and task descriptions.

4.3.4 Supportability Test and Evaluation

Briefly describe the planned supportability test and evaluation concept, scope, and objectives.

4.3.5 ILS Element Plans

Subordinate logistics plans will be developed for specific logistics areas. The content of these plans will be addressed in this paragraph.

a. Maintenance Plan

This plan provides the integrated planning and analysis process which addresses the requirement to assess the design as it relates to maintenance and the development of maintenance requirements.

Table 4-1 LSA TASKS

<u>Task #</u>	<u>LSA Tasks</u>	<u>Task Description</u>
101	Development of an Early Logistics Support Analysis Strategy	Identifies the LSA tasks which will provide the best return on investment.
102	Logistics Support Analysis Plan	Describes and documents the ILS program, authority and management structure and states what tasks are to be performed and who will be responsible for performing the task.
103	Program and Design Reviews	Provides for timely LSA program participation in official review and control of payload design.
201	Use Study	This task identifies pertinent support factors related to the intended purpose of the payload.
202	Mission Hardware, Software, and Support System Standardization	Defines the support and support related design constraints based on support commonality/standardization considerations.
203	Comparative Analysis	Defines an analytical foundation for projecting supportability requirements, identifies cost drivers and documents risk involved in using analytical data.
204	Technological Opportunities	Identifies technological advances and state of the art approaches to supportability.
205	Supportability and Supportability Related Design Factors	Establishes quantitative support characteristics of alternate design and operational concepts, support design objectives, goals, constraints and thresholds.

Table 4-1 LSA TASKS (Concluded)

<u>Task #</u>	<u>LSA Tasks</u>	<u>Task Description</u>
301	Functional Requirements Identification	This task identifies the operations and support functions that will be performed for each alternative and identifies the tasks that will be performed to operate and maintain the system in its intended environment.
302	Support System Alternatives	Establishes the support system alternatives for evaluation and tradeoff analysis.
303	Evaluation of Alternatives and Tradeoff Analysis	This task determines the preferred support system alternative for each system, the best approach and the best balance between risk, cost, schedule, performance and support efficiency.
401	Task Analysis	Analyze required operations and maintenance tasks for the new payload.
402	Early Fielding Analysis	Assess the impact of introduction of the new payload on the existing logistics system.
403	Post-Production Support Analysis	Analyze life-cycle support requirements of the payload prior to the closing of any production lines.
501	Supportability Test, Evaluation and Verification	Assess the achievement of supportability parameters specified, identify reasons for deviation and recommend changes to correct deficiencies.

b. Logistics Support Personnel and Training Plan

This plan contains qualitative and quantitative information for use by responsible management agencies to identify maintenance personnel requirements by numbers, skills, other qualifications, and training requirements.

c. Supply Support Plan

This plan describes the processes for meeting the spare and repair parts requirements. The plan will specifically address provisioning procedures and requirements. Also, the plan will address the use of the LSA process and the maintenance plan in the development and definition of spare and repair parts requirements.

d. Support Equipment Plan

This plan identifies and provides common support equipment and software requirements necessary to accommodate organizational, intermediate, and depot-level maintenance.

e. Technical Data and Documentation Plan

This plan provides the technical data and the documentation planning which prescribes general procedures, terms, and conditions for planning, preparation, and delivery of technical data required for training, maintenance, and operational support of equipment.

f. Logistics Facilities Plan

This plan provides the facilities planning which includes the facilities and equipment required to support maintenance, training, storage, and installation and checkout.

g. Logistics Information System Plan

This plan addresses those data elements, files, reports, and associated hardware and software that provide for status, historical data, trends, management visibility, accountability, performance evaluation, control and allocation of logistics resources.

h. Packaging, Handling, Storage, and Transportation Plan.

This plan addresses the procedures and resource requirements necessary to insure that all system equipment and support items are transported, preserved, packaged, stored and handled properly.

4.4 CONTENT OF SECTION III - ILS MILESTONE SCHEDULE

This section will contain a realistic milestone schedule which shows specific ILS program tasks and events. Figure 4-1 shows a typical integrated logistics support schedule.

ILSP SECTION REFERENCE	TASK DESCRIPTION	RESPONSIBILITY	FY														
	ILS Plan o ILSMT Identification LSA Tasks Maintenance Plan Personnel and Training Plan Supply Support Plan o Provisioning Plan o Provisioning Conference Support Equipment Plan Packaging, Handling, Storage, and Transportation Plan Logistics Facilities Plan Logistics Information System Plan Technical Data and Documentation Plan																

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Fig. 4-1 Typical Integrated Logistics Support Schedule

4.5 ANNEXES

Include any detailed plans or other information as needed to support any portion of Sections I and II as annexes to this plan.

GLOSSARY

Commonality - The use of identical or similar hardware, software, standards, and technical approaches to satisfy multiple sets of functionally similar requirements.

Depot - Facility for performing maintenance on material requiring major overhaul or a complete rebuild of parts, assemblies, subassemblies, and end-items, including the manufacture of parts, modifications, testing, and reclamation as required.

Integrated Logistics Support (ILS) - A disciplined approach to the activities necessary to: (a) cause support considerations to be integrated into system and equipment design; (b) develop support requirements that are consistently related to design and to each other; (c) acquire the required support; and (d) provide the required support during the operational phase at minimum cost.

Integrated Logistic Support Management Team (ILSMT) - A management group responsible for monitoring the ILS process for a given system or payload to ensure adherence to the requirements in the ILS Plan.

Integrated Logistic Support Plan (ILSP) - The plan developed to incorporate all elements of ILS for the life of a system.

Inventory Management System (IMS) - The means by which assets are identified and controlled. The system organizes, manages, and controls the spares, equipment/consumables and other materials needed to ensure the support of systems/subsystems in accomplishing their mission.

Life Cycle Cost (LCC) - The total cost of a system from its inception to its retirement.

Logistics Management Information System (LMIS) - A system that provides the essential management visibility to ensure timely and cost-effective accomplishment of logistics requirements. The main elements are logistics schedules and status reports which will provide a basis for evaluating logistics performance.

Logistic Support Analysis (LSA) - The selective application of scientific and engineering efforts undertaken during the acquisition process, as part of the system engineering and design process, to assist in complying with support-ability and other ILS objectives.

Logistic Support Analysis Record (LSAR) - That portion of LSA documentation consisting of detailed data pertaining to the identification of logistic support resource requirements of a system/equipment.

Long-lead Item - An item, which, because of its complexity of design, complicated manufacturing process, or limited production capacity, causes production or procurement cycles which would preclude timely or adequate delivery, if not ordered in advance of normal provisioning.

Maintainability - The measure of the ability of an item to be retained in or restored to specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair.

Maintenance - All action taken to retain materiel in or to restore it to a specified condition. It includes: inspection, testing, servicing, classification as to serviceability, repair, rebuilding, and reclamation.

Mission Need Statement - A clear, concise description of a specified task, its requirements, and its purpose.

Operations and Support (O&S) Costs - The cost of operation, maintenance, and follow-on logistics support of the end items and their associated support systems.

Orbital Replaceable Unit (ORU) - Any assembly that can be removed and replaced as a unit from an on-orbit system.

Packaging, Handling, Storage, and Transportation (PHS&T) - The resources, processes, procedures, design considerations and methods to ensure that all system equipment and support items are preserved, packaged, handled, and transported properly. This includes environmental considerations and equipment preservation requirements for short and long term storage, and transportability. This is one of the principal elements of ILS.

Parts Screening - Process of assigning National Item Identification Numbers (NIINs) to items to prevent duplicate items from entering the defense supply system.

Phase A - Preliminary analysis to identify and explore alternate concepts to satisfy a validated need.

Phase B - The definition phase when selected candidate solutions are refined through extensive study and analysis.

Phase C - The design phase which includes the detailed definition of the final objectives and project concept.

Phase D - The development/operations phase which covers final hardware design and development, fabrication, test, and project operations.

Provisioning - The process of determining and acquiring the range and quantity (depth) of spares and repair parts, and support and test equipment required to operate and maintain an end item of materiel for an initial period of service.

Reliability - The duration of probability of failure-free performance under stated conditions.

Repair Level Analysis (RLA) - A process for recommending repair levels of units, assemblies, and subassemblies which will accrue minimum total support costs within operational and technical constraints over the system design life. It forms the basis for assigning repair level; repair versus discard-at-failure decision; repair parts provisioning; and Source, Maintenance, and Recoverability (SMR) coding, maintenance planning, and documentation.

Repair Parts - Those support items that are an integral part of the end item or system which are coded as nonreparable.

Source, Maintenance, and Recoverability (SMR) Codes - Uniform codes assigned to all support items to convey maintenance and supply instructions to the various logistics support levels. They are assigned based on the logistic support planned for the end item and its components. The uniform code format is composed of three, two character parts; Source Codes, Maintenance Codes, and Recoverability Codes in that order.

Spares - Those support items that are an integral part of the end item or system which are coded as repairable.

Support Requirements Analysis (SRA) - An analysis accomplished during the system design to establish logistics support requirements. The analysis is a step-by-step process of predicting operational and maintenance activities, and defining and documenting the required resources.

Supply Support - All management actions, procedures, and techniques used to determine requirements to acquire, catalog, receive, store, transfer, issue, and dispose of secondary items. This includes provisioning for initial support as well as replenishment supply support. This is one of the principal elements of ILS.

Supportability - The degree to which system design characteristics and planned logistics resources, including manpower, meet system readiness and utilization requirements.

Support Equipment - All equipment required to support the operation and maintenance of a system. This includes associated multiuse end items, ground-handling and maintenance equipment, tools, test equipment, and automated test equipment. It includes the acquisition of logistics support for the support and test equipment itself. This is one of the principal elements of ILS.

Sustaining Engineering - The on-going engineering process of maintaining and operating a system once it is deployed. This process continues throughout the life of the system.

Test, Measurement, and Diagnostic Equipment (TMDE) - Equipment used to determine the operability of system hardware and support equipment.

Technical Data Package - Recorded information regardless of form or character (e.g., manuals, drawings) of a scientific or technical nature for a given system. Computer programs and related software are not technical data; documentation of computer programs and related software are. Also excluded are financial data or other information related to contract administration. This is one of the principal elements of ILS.

Transportability - The inherent capability of materiel to be moved with available and projected transportation assets to meet established schedules.